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TITLE

SYSTEM FOR CAPTURING TRADE INFORMATION

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to an automated
trade capture system having a client interface.

Related Background Art

Various automated systems already exist for

1   executing trades among brokers, market managers,

individual traders and other financial entities. See,

for example, U.S. Patents Nos. 4,674,044, 5,950,176,

and 5,963,923. In addition, a few large brokerages

have developed on-line trading systems for individual

15   traders. These systems, however, do not provide for

middle office and back office processing, such as by an

investment bank acting either as a principal or a

clearing agent, of a trade previously executed between two parties.

Such middle and back office processing has been performed internally by the investment bank of

5 Lehman Brothers, in an in-house version of its SMARTTICKET™ automated trade capture system. In this system, executed trade information was captured by Lehman Brothers personnel from written documents sent to them from external clients. The captured trade

10 information was then sent through a workflow process consisting of trader and middle office trade authorizations, as well as back office processing.

However, while being automated, this in-house system did not permit any trade capture to be performed

15 by the clients themselves. Further, the trades were mostly limited to derivatives.

A client-assessable trade capture system is desirable, however, because it would provide clients with a single trade capture platform, in which products

20 besides derivatives, such as cash and futures trades, may be handled, which in turn provides the investment house a competitive advantage. A client-assessable trade capture system would also provide the clients with links to the internal risk, margin and

counterparty services of the investment bank, access to historical trade activity, as well as trade validation and confirmation.

SUMMARY OF THE INVENTION

To overcome the above-described and other limitations in the art, the present invention relates to a system that preferably provides an efficient and streamlined system for capturing trades that can be operated by the client at its site.

In one aspect of the present invention, a trade capture system is provided that includes a first computer having an interface for capturing executed trade data, a second computer for accepting the captured trade data and performing middle and back office processing on the same, and a communication channel for communicating the captured trade data between the first and second computers. Preferably, the first computer is a client computer, the second computer is an investment bank computer, and the communication channel is the Internet, wherein the client computer's interface is a browser.

In another aspect of the present invention, a trade capture system is provided which includes a first

computer having an interface for transmitting

electronic trade tickets, a second computer for

receiving the electronic trade tickets and performing

middle and back office processing on the same, and a

5   communication channel for communicating the electronic

trade tickets between the first and second computers.

These and other aspects of the present

invention are described in more detail below.

10   BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a state diagram showing the states

and actions ("workflow") of the present invention.

Fig. 2 is a screen shot of a graphical user

interface of the present invention relating to a new

15 deal.

Fig. 3 is a screen shot of a graphical user

interface of the present invention relating to a swap

accelerator.

Fig. 4 is a screen shot of a graphical user

20 interface of the present invention relating to a

generic swap.

Fig. 5 is a screen shot of a graphical user

interface of the present invention relating to a swap

leg of Party A.

Fig. 6 is a screen shot of a graphical user interface of the present invention relating to a swap leg of Party B.

Fig. 7 is a screen shot of a graphical user interface of the present invention relating to a trade authorization.

Fig. 8 is a screen shot of a graphical user interface of the present invention relating to risk management details.

Fig. 9 is a screen shot of a graphical user interface of the present invention relating to a deal filter.

Fig. 10 is a screen shot of a graphical user interface of the present invention relating to a deal workflow history.

Fig. 11 is a block diagram of the system architecture of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

OVERVIEW

The following describes as a preferred embodiment of the present invention Lehman Brothers' SMARTTICKET™ client-based trade capture system that was first made publicly available on January 17, 2000.

However, the following description is not limited to that system, and may include additional features not present in that system.

An embodiment of the present invention is

5 shown in Fig. 11, and includes a client computer 1100, a communication channel 1102, and the investment bank's middle office and back office processing computer system 1104. As shown in that figure, the client computer 1100 of the present invention is installed at

10 the client's site, and is preferably connected to the investment back's computer system 1104 through the Internet 1106. Of course, other types of well-known communication channels 1102 may be employed instead to connect and communicate information between the client

15 computer 1100 and the investment bank's computer system 1104.

Executed trades may be entered directly into the system's interface 1110 on the client's computer. Alternatively, the client may have its own interface

20 1112 which connects to the system of the present invention, and in that case, the trades are entered by the client into its own interface, which in turn are transmitted through the Internet or other communication channel to the system 1104.

Additionally, the system 1104 may receive from the client's computer 1100, via the electronic trade ticket interface 1114, over the Internet or communication channel, trade tickets which contain the
5 executed trade data. This eliminates, or at least reduces, the need for the client to key trade data into its interface. The investment back system 1104 accepts those trade tickets electronically, preferably using XML technology, on a real-time basis.

10   Because it is desirable for the system 1104 to support as many clients as possible, it supports a wide variety of trades besides traditional derivatives. Accordingly, the system 1104 is described below with respect to trades, such as swaps, swaptions, caps,
15 floors, FX, and cash, related to derivatives, futures and cash products, including both U.S. and non-U.S. products. However, it will be appreciated that the system may be extended to accept executed trades of other financial products. As will be described in more
20 detail below, to give clients more flexibility to trade in both derivatives and cash products, templates exits for both the derivatives and cash business. For example, these templates allow for the capture of

outright bond trades, financing trades and futures and options trades.

Separate entities within the investment bank system 1104 are set up according to product type,

5 mainly for security and safekeeping purposes. For example, for U.S. products and for global derviatives, separate entities are set up for each client in the respective internal system. For non-U.S. cash products, a separate entity is also used to segregate

10 the client's financing trades to properly keep them (i.e., for client reporting and balance sheet purposes). In addition, for U.S. cash products, a unique bank depository may be set up for each client, while for non-U.S. cash products, a investment bank or

15 bank/depository account may be used. Separating each client's data provides a security layer to the system, because a client can view and access only its own trades and no others. Further, a profile may be set up for each client, in which the client is restricted to

20 access only certain products (e.g., swaps), allowing the client to trade in only those products for which it signed up for.

In addition, to support hedge funds clients, the client's interface 1104 supports a client

allocation function. This function allows the client to enter a single trade and then allocate that trade into multiple trades (i.e., multiple funds) based on the allocation breakdown specified by the client. This

5 function significantly speeds up the trade capture process for those clients.

Further, the client's interface may includes a trade blotter screen developed for that client's business. This blotter gives the client the ability to

10 sell of its trades, across different product types, on one integrated screen. Data may be viewed for the current day of any date range entered.

Once the trade data have been captured by the system 1104, the trade data may be routed to the

15 appropriate internal system of the investment house, based on the product. The investment bank may then verbally confirm, on trade date, the trade that the client has executed with its street counter-party. This trade may be confirmed with the investment bank

20 acting as either a principal or as a clearing agent. Once the trades are confirmed, they may be settled by the investment bank, for which the investment bank moves either the cash or securities based on the client's instructions. The client may then be notified

of the trade settlement by the investment bank, for
example, by its computer system, through the
communication channel, to the client's computer.

5 DEAL CAPTURE

This section describes a preferred embodiment of
capturing deal information in the system of the present
invention. Deal capture begins with specification of
the product type to be captured. This allows the
10 system to provide the user with a template for
capturing the specific information needed for that
deal. Field entry is simplified, because values for as
many fields as possible are defaulted based on product
type. As fields are populated, other fields are
15 assigned default values based on that information.
Field entry may then be validated for all fields.
Files may then be saved and named in preparation of
moving deals into the system workflow, which is also
described in detail below.
20   System menus and toolbars may be configured
similar to Microsoft applications, with all functions
available on drop-down menus at the top of the screen.
Selected functions are available as buttons on the
system toolbar. The user preferably has access to all

functions through both mouse and keystroke selection.
If any function cannot logically be performed by a user
based on the user profile, deal state, or mode of file
access, that menu item is made inactive. Inactive menu

5 items are stippled (shaded light gray).

        As shown in Fig. 2, new deals are created by
first selecting a senior product type and a subordinate
product type, which together define the structure and
data fields needed to capture that deal.

10   For example:

        Senior Product Type = Interest Rate Swap
        Subordinate Product Type = Generic Fixed vs.
Floating

        A template may then be stored in system for

15 each combination of senior and subordinate product
types. As new deal structures are recognized, new
product types may be defined, and new templates may be
created by system users. In addition to the system
templates created for all users, each user will be able

20 to create custom (or "user") templates for individual
or shared use. The user will be able to choose from
the lists of system and custom templates to initiate
deal capture. The client's interface preferably only
contains the system templates. Figs. 3 and 4

respectively show a swap accelerator and a generic swap generated by the client using the templates.

When the first piece of deal information is captured, the selected template becomes a "Deal in Progress", which is the first valid deal state (102) in the system workflow. The Deal in Progress is assigned an ID within system that remains with the Deal in Progress until it becomes an authorized deal, or is deleted. The Deal in Progress belongs exclusively to the user creating it until it is explicitly shared with other users, called a Deal in Progress Transfer. The ticket will remain in the user inbox of the creator until it is sent to another user for processing.

In the system of the present invention, Party A may be selected to be the investment bank entity. The defaulting investment bank entity is based on user preferences and can be changed based on a choice list of valid investment bank entities. As for the counterparty (Party B), a counterparty browser allows the selection of that party directly from an entity master database. This ensures that deals are booked with valid counterparties. In addition to counterparty name, branch, and ID, other information about the counterparty stored on the entity master database are

viewable. Preferably, none of the information in the entity master database is editable from the system of the present invention itself, and thus is separately edited. In cases where the counterparty has not yet

5 been set up on the entity master database, the option to enter the counterparty as "TBD" (To Be Determined) with a free-format name is provided. Replacement of the "TBD" counterparty with a counterparty from the entity master database may be enforced by preventing

10 the deal from reaching its final state until the "TBD" counterparty issue is resolved.

System field entry consists of populating the selected template with deal information. In most cases, fields will have a default value based on the

15 product type, or the values of other fields. The user may override these defaults, however, usually by picking from a choice list of values.

Field values are typically validated according to validation rules recorded in the system.

20 If a field value is determined to be invalid, an error message is displayed and the focus will remain on that field. Where applicable, fields may be validated in the context of the values of other fields on the ticket.

The system also includes a field propagation engine, which is used to propagate the effects of one changed field value on other fields. A change in one field may propagate such changes to other fields such as making them visible or invisible, changing their default values, and determining whether they are required or not required.

Required fields are those fields that must be populated given the selected product type, the values of other fields that have already been populated, and the state of the deal (which states are described in detail below). If a field is required given these parameters, the system does not allow the deal to transition to the next state. There no fields required for a ticket to exist in the Deal in Progress state. All economic data fields are preferably required before trader authorization can occur.

A limited free-format comment field is provided on each template to capture information that cannot be captured on an existing template. This comment field is monitored by the middle office so that an appropriate custom template can be constructed.

System deal legs may be selected, copied, and pasted within deals or from one deal to another. The

deal the leg is being copied from may be open in Write

Mode or Read-only Mode, but the deal the leg is being

pasted onto must typically be open in Write Mode. If a

deal is open in Write Mode, legs may be selected and

5   deleted. Legs may also be chosen from a menu of

available legs to be inserted onto a deal. A display

of swap legs is shown in Figs. 5 and 6.

During deal capture, the system periodically

saves captured deal information to a temporary file to

10   minimize data loss due to an interruption in network

service or an unanticipated PC re-boot. The temporary

save occurs every pre-determined number of minutes

(e.g., five minutes), and the temporary file is deleted

when the user explicitly closes the file, which is

15   known as a "clean close". When logging on to the

system, the user is advised of any files that were not

"closed clean" when the user last logged out. The user

may then be given the option to recover the last

autosaved version of the file.

20   A file may be saved as a Deal in Progress or

as a custom template. If a deal in progress has not

previously been explicitly saved, the user may be

prompted to save the file as a Deal in Progress or as a

custom template. If the file has been previously

saved, or if the file is an authorized deal, the updated version of the file may be saved in place of the old version. Any file may be saved as a Deal in Progress. None of the fields on a system or custom

5 template are required for a file to be saved as a Deal in Progress. Any file open in Write Mode or Read-only Mode may be saved as a custom template. The resulting custom template will be "owned" by the user who created it, and will be available only to that user unless

10 explicitly changed by that user.

Preferably, system file names consist of the originating office, the trade date, the Party A ID, the Party B ID, and a user-defined free-format portion. This free-format portion is created by the user who

15 originates the deal, and may be changed only by that user unless "ownership" of that deal is explicitly changed.

SYSTEM WORKFLOW

20 This section describes a preferred embodiment of the workflow of the system of the present invention. System workflow entails moving a ticket through a series of states, each closely associated with a group of users that must process the ticket in each state.

There are five valid deal states: Deal in Progress 102,
(Deal) Pending Trader Authorization 104, (Deal) Pending
AAA Authorization (105), (Deal) Pending Middle Office
Processing (106), and Active Deals in Back Office

5 (107). In the basic workflow, a Deal in Progress is
created by the client or by a marketer, who populates
most of the deal information fields and obtains the
necessary credit and AAA approvals (AAA approvals are
simply an extra level of authorization required for

10 certain deals by the investment bank). The Deal in
Progress of state 102 is then submitted for trader
authorization, entering the Pending Trader
Authorization state 104. When authorized, the deal
then moves to the Pending Middle Office Processing

15 state 106. When this is complete, the ticket is
authorized to the final state, Active Deals in Back
Office 107. If the deal is an AAA trade, it must pass
through the additional state 105 of Pending AAA
Authorization before reaching the Pending Middle Office

20 Processing state 106. At any time after the ticket
becomes an authorized deal, users will be able to
Attach Proposed Edits to the ticket and re-submit it
for Trader Authorization. The system workflow also
handles processing of terminations and assignments.

Fig. 1 is a state diagram showing the states
and actions of the system workflow. Each large circle
represents one state that the executed trade, or
"deal", may take while being processed by the system.
5   The thick, dark arrows represent successful movements
in which the deal goes forward. The dotted lines
represent deal deletions or rejections, or a rejection
by the trader of a proposal from the middle office or
back office. The dashed lines represent proposals from
10   the middle office or back office.

Fig. 1 is a state diagram showing the states
In state 101 "Deal Being Created But Not
Saved Yet", the client enters into the graphical user
interface of the system the required trade information,
as well as other deal-related information, as explained
15   further below. When all necessary information has been
entered, the client saves the deal, which brings the
workflow to state 102, "Deal in Progress".

In state 102, two actions may occur: the
client may delete the deal in progress, in which case
20   the workflow moves to state 103, "Deal No Longer
Exists". At that point, the deal dies and no further
action is taken.

Alternatively, the deal is submitted to the
trader for authorization, in which case the workflow

moves to state 104, "Pending Trader Authorization". In

this state, the trader may authorize or reject the

deal. If the deal is rejected, the workflow returns to

state 102, at which point the client may update the

5   deal in progress and resubmit for authorization, or may

delete the deal.

    As stated above, in state 104, the deal may

be authorized by the trader, in which case the workflow

moves to state 106, "Pending Middle Office Processing".

10   In certain cases, which are explained in further detail

below, the deals must be additionally authorized by AAA

and before being sent to the middle office for

processing. In this case, the deal is sent to state

105, "Pending AAA authorization". Upon AAA

15   authorization, the workflow moves to state 106 for

middle office processing. Otherwise, if AAA rejects

the deal, the workflow returns to state 104, at which

point the deal may be updated or rejected back to the

client.

20   In state 106, the middle office may authorize

the deal, and depending upon the deal action type,

either sends it to the back office, in which case the

workflow moves to state 107 "Active Deals in Back

Office", or to the inactive deals, in which case the

workflow moves to state 108 "Inactive Deals". Upon

deal authorization, the client is notified of the same.

Alternatively, the middle office may reject

the deal back to the trader, in which case the workflow

5   returns to state 104, or to the AAA authorizer, in

which case the workflow returns to state 105. In the

former case, the trader may update the deal and

resubmit it to the middle office (to state 106), or may

instead send the rejected deal back to the client (to

10 state 102). In the latter case, the AAA authorizer can

update the deal and resubmit it to the middle office

(to state 106), or may instead send the rejected deal

back to the trader (to state 104), which is handled by

the trader as described above.

15   In addition, the middle office may propose

that the deal be canceled, in which case the workflow

returns to state 104. The trader may then cancel the

deal and notify the client, or may reject the proposed

cancellation, in which case the workflow returns to

20 state 106.

Deals are characterized by an action type

(listed with its associated abbreviation), including

but not limited to:

New deals: ND;

Change (aka Correct/Edit): CH;

Termination - Full: FT;

Termination - Partial: PT;

Assignment - Full Only: FA;

5   Cancellation: CA;

Option Exercise: CX; or

Option Expiry: OX.

Further, deal in progress may be saved or deleted, new deals may be rejected, deals may mature, and proposals 10 may be rejected.

If the deal action is a full termination, a cancellation, and option exercise or an option expiry, all of which represent of inactive deals, the middle office authorizes the deal to be sent to state 108. 15 Otherwise, if the deal is a new or corrected deal, or involves a partial termination or an assignment, all of which represent active deals, the deal is sent to the back office for further processing (in accordance with the required action), state 107. In addition, the deal 20 may mature via the payment system of the back office, in which case it becomes inactive and the workflow moves to state 108.

The back office may make certain proposals to the deal to the trader, as follows: changes (edits);

full terminations; partial terminations; assignments;

cancellations; option exercise; or option expiry.

These proposals move the workflow back to the trader in

state 104. The trader in turn may update the deal to

5   reflect the proposal, in which case the workflow

proceeds from state 104 as described above (i.e, to

states 102, 105 or 106), or the trader may reject the

proposal back to the back office, state 107.

In addition, the small circles represent

10   points (1)-(8) at which external publication may occur

be the printing of "drop copies," described in more

detail below.

In the system of the present invention, each

state has a group of users responsible for processing

15   the ticket while it is in that state. When processing

in a given state has been completed, a user may move

the ticket onto the desktops of the users responsible

for processing in the next state, which is called

herein the "State Transition Process". Each time a

20   ticket is submitted for authorization or is authorized,

a dialog box may be displayed. Within this dialog box,

the user may specify which users, or group of users,

should be prompted to process the ticket next. The

dialog box preferably has a default, pre-selected user

or group of users who are responsible for processing in the next state. However, it is possible to include more users to the workflow through this dialog box, but the ability to exclude users is preferably restricted.

5   As a ticket moves from a Deal in Progress from user to user through the workflow, it appears in the user inbox of the user(s) responsible for processing it. The user inbox is preferably represented by an on-screen indicator which provides

10 notification of the number of deals awaiting processing by that user or group of users. The user may be notified of the arrival of new deals for processing. By selecting this indicator with the mouse, a user can view a list of unprocessed deals. The time each item

15 was received in the user inbox may also be displayed. The user can drill down directly from the list into the deal awaiting processing.

          In addition to routing tickets for workflow purposes, system users may also send informational

20 messages to other system users. When moving tickets from one state to another, the same dialog box used to move the ticket to the next user in the workflow also allows distribution of an FYI Message to other users not directly in the workflow. The user receiving the

FYI Message can read the message and drill down to the
ticket attached to it in Read-only Mode. FYI Messages
may also be sent directly at any point in the system,
with no deal attachment. The user is preferably
5   notified of the arrival of new FYI Messages. Each user
typically has an on-screen indicator that provides
notification of the number of unread FYI messages in
the user's queue. By selecting this indicator with the
mouse, a user can view a list of all messages. The
10 time each message was received may also be indicated.
Read items are preferably differentiated from unread
items, and the user can delete any item.

Each user can display a dialog box with a
summary of items in the user inbox and the FYI message
15 queue.

Ownership of a Deal in Progress may be handed
off from user to user before being submitted for trader
authorization, which is called herein a "Deal in
Progress Transfer". A dialog box is preferably
20 displayed allowing the first user to specify which user
will own and process the ticket next. While the Deal
in Progress Transfer appears to be similar to the State
Transition Process, the movement of a Deal in Progress

from the queue of one user to another is a lateral
transfer with no state change.

Before an "AAA" Deal in Progress becomes an
authorized deal, it must be approved by an AAA business
5   manager. This approval is initially obtained during a
phone call between the trading desk and the AAA
business manager. The marketer or trader preparing the
ticket typically records the name of the person
granting AAA approval on the Deal in Progress.

10   A Deal in Progress enters the system workflow
by being submitted to a trader for authorization. (See
Fig. 7) This function can be performed by a marketer
submitting a Deal in Progress to a trader, or by a
trader submitting a Deal in Progress to another trader.
15   Upon submission, the state of the Deal in Progress will
change to Deal Pending Trader Authorization 104, and
the trader will be prompted to authorize it.

During Trader Authorization, a Deal Pending
Trader Authorization becomes an authorized deal for
20   processing by Middle and Back Office users. In the
case where there is no marketer in the workflow, a
trader may authorize a deal directly from the Deal in
Progress state 102 to the Middle Office Processing
state 106. Preferably, all required fields are checked

for population and all fields are validated. If these
criteria are met, the Deal in Progress ID is
relinquished, and a unique, permanent ID is assigned to
the authorized deal.

5   A deal requiring AAA authorization must be
authorized by an AAA business manager before moving to
the Pending Middle Office Processing state 106 (an
initial authorization by the AAA business manager was
previously done while the Deal in Progress is created,
10   as described above). The trader authorizing an AAA
trade is advised that the trade is being submitted for
AAA authorization, and the state of the deal changes to
Pending AAA Authorization 105. AAA system users
subsequently authorize the deal to the Pending Middle
15   Office Processing state 106.

          Middle office authorization occurs when the
deal has been captured on all relevant risk management
and payment systems. (See Fig. 8) The deal then
enters its final active state, Active Deals in Back
20   Office 107.

          After trader authorization, users may propose
changes to a deal by entering Proposed Edit Mode.
Certain aspects of the on-screen appearance of the
deal, such as the desktop background color, preferably

change to indicate that the deal is in Proposed Edit
Mode. System fields that are editable in at least one
state then become editable. An optional free-format
comment field may also be made available to users to
5 capture an explanation of the proposed edit.

Once proposed edits have been attached, a
deal is typically re-submitted for trader authorization
in state 104. Usually, the trader who initially
authorized the deal becomes responsible for accepting
10 or rejecting proposed edits.

Once submitted, proposed edits preferably
appear in the user inbox of the trader who originally
authorized the deal. A proposed edit symbol appears
next to deals with attached proposed edits to
15 differentiate them from other Deals Pending Trader
Authorization. The trader can select the item with the
mouse and view a summary of proposed edits, which
include both the original and proposed values of the
fields being edited. The user proposing the edit, the
20 time the edit was proposed, and the comment explaining
the edit may also be displayed.

A trader may apply or reject all proposed
edits, or selectively apply or reject edits to specific
fields. If at least one proposed edit is applied, the

amended ticket is sent through the workflow. If all of the proposed edits are rejected, the ticket is not re-sent through the workflow. In either case, the user who submitted the proposed edit is typically advised of

5 which edits were applied or rejected.

The cancellation process works like the proposed edit process, except that it is a separate menu item, and that users propose cancellation of the deal in its entirety, rather than modification of

10 selected fields. A cancellation ticket is sent through the workflow.

Terminations and assignments are processed very similarly to proposed edits in system. The process may be initiated and authorized at the trader

15 level, or initiated downstream and submitted for trader authorization. In cases of termination or assignment, the user is typically prompted for termination or assignment fee information, legal effective date, and economic effective date.

20 For full termination, the termination ticket is sent through the workflow. For partial termination, the user is preferably prompted for the terminated notional amount. The original ticket with amended notional amount is then sent through the workflow. For